

IN THE DRAWINGS:

The attached sheet of drawings includes changes to FIG. 4. This sheet, which includes only FIG. 4, was previously submitted with the last response filed by the applicant with the intent of replacing the original sheet which included FIG. 4. FIG. 4 had been amended by substituting the reference number "28" for the reference number "50". The instant submission is being made in view of an apparent misplacing of the previously submitted FIG. 4. No new matter has been added.

REMARKS

The Office Action mailed 14 March 2006 has been received and considered. The applicant respectfully requests reconsideration of the application and the pending claims thereof.

OBJECTION UNDER 37 CFR 1.83(A):

The drawings of the instant application are objected to under 37 CFR 1.83(a).

With reference to the language “two geometrical shapes” as set forth in claim 7, applicant respectfully submits that two geometrical shapes for the injection orifices are currently disclosed in the drawings presently pending before the Examiner. Specifically, applicant refers to the shape of the injection orifices (28) illustrated in FIG. 4 and the injection orifice (25) illustrated in FIG. 5. In FIG. 4 the orifices (28) are depicted as being formed by the parallel linear sidewalls of the channel which interconnects the chamber (24) with the orifices. In contrast in FIG. 5 the orifice (25) is formed by a channel which is formed of sidewalls which are neither linear nor parallel about the longitudinal axis of the channel. It follows that the orifice formed by the sidewalls of the channel in FIG. 5 would have a shape which is different from that of FIG. 4. In view of these considerations, applicant respectfully submits that the drawings presently disclose two different orifice configuration and therefore the drawings satisfy the requirements of 37 CFR 1.83(a).

With regard to the objection to the drawings based on the perceived absence of a reference number “28” in the drawings, applicant submits herewith a FIG. 4 wherein the reference number “28” is clearly indicated. Applicant had previously submitted this same amended FIG. 4 in his response to the last Office Action. However, it appears from the Examiner’s comments that this amended drawing figure has been misplaced by the Office. The instant submission is intended to complete the file of the Office in this matter.

In view of the above considerations, applicant respectfully submits that the objections under 37 CFR 1.83(a) should now be withdrawn.

REJECTION UNDER 35 USC 102(B):

Claims 1 through 7 stand allegedly rejected under 35 USC 102(b) over Raggio in view of Surles or vice versa. In advancing the instant rejection the Examiner maintains that "Raggio shows a gas lift valve V that injects gas through orifices 14e into nose 15, then into the interior of the tubing T through an injection orifice 22 which points upwards. While illustrated as mounted to an external mandrel, the valve can be mounted in a side pocket (col. 5, lines 19-23)."

Applicant respectfully traverses the Examiner's rejection.

Raggio does not appear to contain a single textual reference to the direction of gas injection into the tubing "T". In applicant's view the absence of such a reference is clear, namely that Raggio was not concerned about the flow direction of the fluid being injected into the tubing.

One of the principal objectives of applicant's invention is the optimization of gas introduction into the flow of production fluid through the production tubing. In this respect the Examiner is respectfully directed to paragraphs [0030], [0044], and [0057] of applicant's specification. The specific direction of the fluid flow being injected into the production fluid flow is critical in achieving applicant's objective. As discussed in applicant's specification, conventional mandrels adapted for use in side pockets are configured to inject a gas flow either horizontally or downwardly into the fluid flowing through the production tubing. Applicant's Claim 1, in contrast, requires at least one injection orifice configured for injecting gas upwards into the interior of the body of the mandrel for a gas lift valve. More specifically, Applicant's Claim 1 is directed to an arrangement wherein the injected gas is directioned along a flow path whereby upon its exit from an injection orifice the gas is traveling in an upward direction. By mandating this particular flow direction the momentum of the injected gas flow contributes to the momentum of the upward flow of the production fluid through the tubing.

Applicant's approach stands in contrast to that of the conventional approach which teaches the art to introduce the injection fluid into the production tubing in a direction which

diminishes the momentum of the reservoir fluid flow. The criticality of this particular feature of applicant's invention is set out in applicant's specification at paragraphs [0026] through [0030]. Further explanation is set forth in paragraphs [00119]-[00125] wherein applicant also discusses the use of the injection orifice(s) to obtain the benefits of the "Coanda effect". This effect is specifically referenced in paragraphs [0038] through [0044] of applicant's specification. This effect is described in more detail in Coanda et al (US 3,784,325). It follows that applicant has clearly set out in his specification, the need for introducing fluid into the production tubing in an upward direction and the criticality of adopting that particular direction for introducing the fluid.

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In applicant's view, until the filing of applicant's application, the art had not recognized the need nor the implications associated with introducing the injection fluid into the production tube in an upward direction. More particularly, the art had not recognized that by adopting applicant's upward direction for introducing the injection fluid, the injected fluid would actually contribute to the momentum of the production fluid flowing in the production tube. In support of applicant's position, the teachings of McMurry and Abercrombie (US 4,110,057) is illustrative. The McMurry and Abercrombie (hereinafter "McMurray") application was filed almost at the same time of that of Raggio. This application was directed to a conventional (external) gas lift mandrel. As one can note from Fig. 5 of the McMurray patent, which represents one of the possible embodiments of the McMurray invention, and its description (column 11, last paragraph), the injection is performed through passage 144 into production stream at 146 in a horizontal direction. This shows that at the time of Raggio the direction of gas injection was not considered important. If it were considered relevant, certainly McMurry and Abercrombie would have presented this feature in their invention.

In column 5, lines 19-23, Raggio cites that the valve can be used in a side pocket mandrel "in the known manner". One skilled in the art of gas lifts would clearly understand from this statement that the valve of Raggio may be mounted in an ordinary side pocket mandrel like the one presented in Lamb (RE 25,760). Lamb was previously cited by the examiner in the immediately previous Office Action. There appears to be no reason that would lead a skilled person to use the valve of Raggio in a side pocket mandrel with upward gas injection. Raggio

does not make even a single textual comment about the need for an upward gas injection. Instead, Raggio simply teaches the use of his invention in a side pocket mandrel **“in the known manner.”**

In applicant’s view, Raggio’s use of the terminology “in the known manner” must be interpreted in the context of the art at the time of the filing of the Raggio application. As will be shown by the following review of the art at the time of the Raggio filing, “in the known manner” should be construed as meaning the injection of the fluid downwardly into the production tubing.

Decker (US 5,066,198) reviews the state of the art regarding gas lift valves and mandrels used in the beginning of the 90's. In fact, the mandrels presented therein are still used today with only slight modifications. Figure 2 of Decker presents a state-of-the-art side pocket mandrel. Here again, the gas injection is downward. Figure 8 presents a state-of-the-art conventional (external) mandrel. The gas injection is horizontal. Decker makes no reference to the importance of the gas injection direction. The reason for that is clear, the art had not recognized the importance of the direction of fluid injection. In fact, this recognition did not occur until applicant’s instant invention.

Assuming *arguendo* the correctness of the examiner's argument, that is, that Raggio shows that upward injection is more efficient and that such an injection direction is obvious, one could expect that subsequent publications would have acknowledged this key point. The text of the Decker patent appears to disprove this position. In applicant’s view, Raggio did not recognize the need for orienting the injection flow in an upward direction, nor did Raggio recognize the benefits that would be achieved by adopting such an orientation..

With respect to the Examiner’s position that the teachings of Raggio can be combined with those of Surles, the examiner has maintained that "Surles shows such a mounting arrangement, ... It would have been obvious to place Raggio valve in a side pocket mandrel as shown by Surles, with a seal at the lower body because Raggio teaches the equivalence of such

an arrangement." Applicant respectfully disagrees.

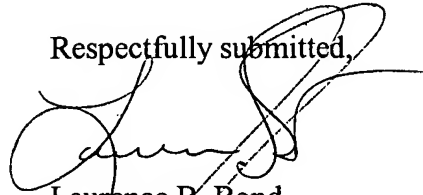
The combination of Raggio with Surles is not warranted. Surles describes a two-way gas lift valve, that is, a gas lift valve which allows flow from the tubing to the annulus and vice versa. Raggio shows a one-way gas lift valve. The valve of Raggio would not properly function in the Surles mandrel. It is established law that if a proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teaching of the references are not sufficient to render the claims *prima facie* obvious. See *In re Ratti*, 270 F. 2d. 810, 123 USPQ 349 (CCPA 1959). In the instant context, applicant respectfully submits that the combination proposed by the Examiner would impermissibly change the principle of operation of the either the Raggio or the Surles apparatus and therefore the combination is unwarranted. Furthermore, there would be no justification nor motivation for a skilled person to suggest such a combination. Even considering this combination there is no reasoning that would lead a skilled person to modify the Surles mandrel in order to facilitate a one way injection in an upward direction. As indicated previously Raggio does not provide any textual suggestion that the gas injection direction is of any importance.

In view of these considerations, applicant respectfully submits that the combination of Raggio and Surles does not meet the requirements of 35 USC 103 and therefore the rejection based on thereon should be withdrawn.

CONCLUSION:

In view of the instant amendments to the claims, specification and drawings, applicant respectfully requests reconsideration of its application and the issuance of a notice of allowance.

Respectfully submitted,



Laurence B. Bond
Registration No. 30,549
Attorney for Applicant(s)
TRASKBRITT
P.O. Box 2550
Salt Lake City, Utah 84110-2550
Telephone: 801-532-1922

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